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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/929,503	08/15/2001	Tetsufumi Tsuzaki	50395-102	8232

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EXAMINER

CUNNINGHAM, STEPHEN C

ART UNIT

PAPER NUMBER

3663

DATE MAILED: 04/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/929,503

Applicant(s)

TSUZAKI ET AL.

Examiner

Stephen C. Cunningham

Art Unit

3663

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 2-3-03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-13 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-7, 9-13 is/are rejected.
- 7) ☒ Claim(s) 5 and 8 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                             | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

**DETAILED ACTION**

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 4, 6, 7, 9, 10, 12, and 13 rejected under 35 U.S.C. 103(a) as being unpatentable over Miyakawa et al. '123.

Applicant cannot rely upon the foreign priority papers to overcome this rejection because a translation of said papers has not been made of record in accordance with 37 CFR 1.55. See MPEP § 201.15.

With respect to claim 1, Miyakawa et al. '123 teach a gain module comprising:

a plurality of optical fibers which differ from each other with respect to composition; and

one or more pump light sources which supply pump light for Raman amplification.

The plurality of optical fibers are selected from single mode fiber (SMF), reverse dispersion fiber (RDF), and dispersion shifted fiber (DSF). These fibers inherently have different compositions, see paragraphs 0030, 0032, 0041-0043. Miyakawa states, in paragraph 0041, that the Raman gain coefficient depends on the dopants and, in paragraph 0042, the fibers

have different Raman gain coefficients. It would have been obvious to one of ordinary skill in the art to modify the glass composition of the optical fibers in order to control the ratio of the gain coefficient of the second fiber to the gain coefficient of the first fiber.

With respect to claim 4, Miyakawa et al. '123 teach that the fibers are connected in series, see figure 1.

With respect to claim 6, Miyakawa et al. '123 teach that the fibers are pumped with a single wavelength, see figure 1, and paragraph 0023.

With respect to claim 7, Miyakawa et al. '123 teach that the light from one pump source is supplied to said plurality of fibers, see figure 1, and paragraphs 0022 – 0027.

With respect to claim 9, Miyakawa et al. '123 teach that the optical region of at least one of the optical fibers is doped with  $\text{GeO}_2$ . See paragraph 0041.

With respect to claim 10, Miyakawa et al. '123 teach that the optical region of at least one of the optical fibers is doped with  $\text{P}_2\text{O}_5$ . See paragraph 0041.

With respect to claim 12, Miyakawa et al. '123 teach optical communication system comprising optical transmission lines and one or more pump light sources; and

wherein the optical transmission lines comprise a plurality of optical fibers with optical regions of different compositions. See figures 1, 8 and

paragraphs 0002, and page 3. RDF, SMF, and DSF inherently have different compositions. These fibers have different compositions, see paragraphs 0030, 0032, 0041-0043. Miyakawa states, in paragraph 0041, that the Raman gain coefficient depends on the dopants and, in paragraph 0042, the fibers have different Raman gain coefficients. It would have been obvious to one of ordinary skill in the art to modify the glass composition of the optical fibers in order to control the ratio of the gain coefficient of the second fiber to the gain coefficient of the first fiber.

With respect to claim 13, Miyakawa et al. '123 teach a communication system comprising:

a plurality of optical fibers which differ from each other with respect to composition; and

one or more pump light sources which supply pump light for Raman amplification.

The plurality of optical fibers are selected from single mode fiber (SMF), reverse dispersion fiber (RDF), and dispersion shifted fiber (DSF). These fibers inherently have different compositions, see figure 1, paragraph 0002, and page 3.

2. Claims 2 and 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyakawa et al. '123 in view of Galeener et al.

Miyakawa et al. teach optical fiber comprising  $\text{GeO}_2$  or  $\text{P}_2\text{O}_5$ , see paragraph 0041. Galeener et al teach that optical fiber comprising  $\text{GeO}_2$  or  $\text{P}_2\text{O}_5$  has a Stokes shift greater than  $400\text{ cm}^{-1}$ .

3. Claim 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyakawa et al. '123 in view of Akasaka et al.

Claim 11, Miyakawa et al. '123 teach a Raman amplifier comprising:

a plurality of optical fibers which differ from each other with respect to composition; and

one or more pump light sources which supply pump light for Raman amplification.

The plurality of optical fibers are selected from single mode fiber (SMF), reverse dispersion fiber (RDF), and dispersion shifted fiber (DSF). These fibers inherently have different compositions, see figure 1 and page 3.

Akasaka et al teaches a Raman fiber amplifier comprising a control unit. It would have been obvious to modify the apparatus of Miyakawa et al. '123 by adding the control apparatus of Akasaka et al. in order to allow the amplifier to compensate for dynamic input characteristics.

***Allowable Subject Matter***

Claims 5 and 8 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The nearest prior art to claim 5 is Ma et al. P.N. 6,151,160 which teaches an amplifier that amplifies signals in a parallel band amplifier, but fails to teach that the parallel gain fibers have different compositions. The nearest prior art to claim 8 is Miyakawa et al. which teaches an amplifier comprises two fibers where the fiber located remotely from the pump has a high Raman gain coefficient compared to the fiber located adjacent to the pump. The instant invention teaches pumping each of the fibers, where each fiber has a different core glass composition, at a different wavelength from each of the fibers rather than a remotely pumped gain fiber.

### ***Response to Arguments***

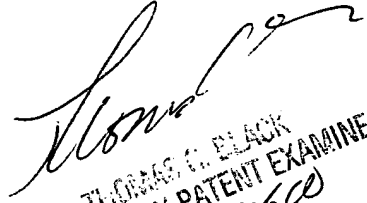
The applicant argues that the Miyakawa reference does not teach fibers with differing compositions. The examiner acknowledges that the Miyakawa reference does not explicitly state that the first and second fibers have different glass compositions and therefore fails to satisfy the conditions necessary for 35 U.S.C. 102 however, the reference does supply motivation for supplying two fiber with different compositions.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen C. Cunningham whose telephone number is 703-605-4275. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on 703-305-8233. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9326 for regular communications and 703-872-9327 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1113.

SCC  
April 21, 2003

  
THOMAS G. BLACK  
SUPERVISORY PATENT EXAMINER  
GROUP 3600